

VIII.3.3-PEAKFLOW PEAK FLOW OPERATION

Identifier: PEAKFLOW

Operation Number: 47

Parameter Array: The FORTRAN identifier used for the parameter array is PO. The contents of the PO array are:

<u>Position</u>	<u>Contents</u>
1	Operation version number
2-6	Description
7-8	Simulated instantaneous discharge time series internal identifier
9	Simulated instantaneous discharge time series data type
10	Simulated instantaneous discharge time series time interval (HR)
11-12	Observed instantaneous peak flow USGS station identification number
13	Window size (days) on each side of observed peak for determining corresponding simulated peak - maximum value allowed is 3 days
14	Total number of observed peaks to be processed
15	Display option switch for simulated versus observed peaks (table only currently available): 0 = table only 1 = table and graph
16	Option indicator: 0 = display peaks chronologically 1 = display peaks by magnitude
17-24	File name of input data (maximum 32 characters)

Scratch File: The scratch file stores information on the observed peak events during the calibration run. Each scratch file record stores data values for each observed peak that occurs during the run period; the observed peak discharge, stage and its month, day, year and data qualifier flags from the USGS; the simulated peak discharge, stage and its month, day and year. The scratch file will create a record for every observed peak in the run period.

Carryover Array: The FORTRAN identifier used for the carryover array is CO. The contents of the CO array are:

<u>Position</u>	<u>Contents</u>
1	Sequence number of last observed peak event processed in the entire run period
2	Number of carryover peaks remaining to be processed in the current run/month of the EX47 routine
3	Blank
4	Largest peak flow value (simulated or observed) in the entire run period
5	Smallest peak flow value (simulated or observed) in the entire run period
6	Maximum peak discharge associated with the carryover peak date from the portion of the carryover window in the previous month. Initial default carryover discharge value is set to -999. Carryover is not updated unless necessary.
7	Day of the month that the simulated carryover peak occurred. The month and year of the peak are determined internally during execution. Initial default carryover day is set to -999.

Carryover positions 6 and 7 are repeated for each of the maximum possible carryover peaks to be processed. Maximum number of carryover peaks to be processed equals two times the search window size.

Subroutines Names and Functions: The subroutines associated with this Operation are:

<u>Subroutine</u>	<u>Function</u>
PIN47	Input information and stores values in the PO array
URPEAK	Read observed instantaneous peak flow data
PRP47	Print information stored in the PO array
EX47	Execute the PEAKFLOW Operation - computes simulated peak which corresponds to the observed peak and writes it to the scratch file
TABL47	Print table and comparative statistics of the simulated versus observed instantaneous peak flow events
SORT47	Sort the simulated and observed data by order of

Subroutine Function

magnitude - finds the maximum and minimum peak flow values for the entire run period

TAB47 Makes entries into the Operations Table

PUC47 Generates card images from the PO array which can be read by the PIN47 subroutine

Subroutines PIN47, PRP47, TAB47 and PUC47 have the standard argument lists for these subroutines as described in section VIII.4.3.

SUBROUTINE URPEAK (PEAKID,IFSTMO,IFSTYR,ILSTMO,ILSTYR,MAXPKS,DATAFN,
IUNITS,IBUG,NUMPKS,PEAK,ISTAT)

Function: This subroutine obtains peak stage, discharge and date for all USGS observed peaks that occur during the requested period of record.

Argument List:

<u>Variable</u>	<u>Input/ Output</u>	<u>Type</u>	<u>Dimension</u>	<u>Description</u>
PEAKID	Input	A8	2	USGS station ID number
IFSTMO	Input	I*4	1	First month of the time period of interest
IFSTYR	Input	I*4	1	First year of the time period of interest
ILSTMO	Input	I*4	1	Last month of the time period of interest
ILSTYR	Input	I*4	1	Last year of the time period of interest
MAXPKS	Input	I*4	1	Maximum number of water years that can be stored in output arrays (approximately 30*number of years)
DATAFN	Input	A20	1	Peak flow data file name
IUNITS	Input	I*4	1	Units (stage/discharge): 1 = metric (M/CMS)(units must be in metric)
IBUG	Input	I*4	1	Debug print option: 0 = no 1 = yes
NUMPKS	Output	I*4	1	Number of peaks found in the time period selected
PEAK	Output	R*4	20,MAXPKS	Stores the peak flow data in positions 1-7, year, month, day, discharge, stage, flag discharge, flag stage - the remainder is used for simulated peak data
ISTAT	Output	I*4	1	Status indicator: 0 = data set complete 1 = error opening data file 2 = error reading data file 3 = error closing data file

SUBROUTINE EX47 (PO,CO,SIMTS,WORK,SWORK)

Function: This subroutine executes the PEAKFLOW Operation.

Argument List:

<u>Variable</u>	<u>Input/ Output</u>	<u>Type</u>	<u>Dimension</u>	<u>Description</u>
PO	Input	R*4	24	Parameters and other information
CO	Both	R*4	Variable	Carryover information; next peak to be processed, carryover discharge and day, and max and min peak discharge
SIMTS	Input	R*4	Variable	Simulated instantaneous discharge time series (CMS)
WORK	Both	R*4	Variable	Temporary work space used to store the active records of the water year scratch file
SWORK	Both	R*4	Variable	Temporary work space used to sort the simulated and observed peaks by order of magnitude

SUBROUTINE TABL47 (PO,WORK)

Function: This subroutine prints table and comparative statistics of the simulated vs. observed peak events.

Argument List:

<u>Variable</u>	<u>Input/ Output</u>	<u>Type</u>	<u>Dimension</u>	<u>Description</u>
PO	Input	R*4	24	Parameters and other information
WORK	Input	R*4	Variable	Simulated and observed peak stages, discharges and dates they occurred

SUBROUTINE SORT47 (PO,CO,WORK,SWORK,ISTAT)

Function: Sorts the simulated and observed peak data by order of magnitude and finds the maximum and minimum values of the simulated and observed data and stores it in the carryover array.

Argument List:

<u>Variable</u>	<u>Input/ Output</u>	<u>Type</u>	<u>Dimension</u>	<u>Description</u>
PO	Input	R*4	24	Parameters and other information
CO	Input	R*4	Variable	Carryover information, and maximum and minimum discharge values
WORK	Both	R*4	Variable	Array used to store simulated and observed peak discharge values and the dates they occurred
SWORK	Both	R*4	Variable	Array used to store sort the simulated and observed peak discharge values by order of magnitude
ISTAT	Output	I*4	1	Status indicator: 0 = no errors sorting 1 = errors sorting